The linearity conjecture for k-blocking sets in $\mathrm{PG}(n, q^3)$

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(joint work with Leo Storme)

A *k-blocking set B in* $\mathrm{PG}(n, q)$ is a set of points such that every $(n-k)$-space contains at least one point of B. A k-blocking set is called *small* if $|B| < 3(q^k + 1)/2$, and *minimal* if B has no k-blocking set as a proper subset.

The linearity conjecture (see [1]) states that all small minimal k-blocking sets $\mathrm{PG}(n, q)$ are linear.

In this talk, we focus on the linearity conjecture for k-blocking sets in $\mathrm{PG}(n, q^3)$. In the first part of this talk, the necessary background regarding blocking sets and linear sets is discussed. In the second part, we give a proof for q prime, $q > 7$.

References

[1] P. Sziklai. On small blocking sets and their linearity. *J. Combin. Theory, Ser. A*, **115** (2008), no. 7, 1167–1182.